

Overview

Construction and Environmental Compliance and Restoration (CECR) provides for design and execution of programmatic and non-programmatic discrete and minor revitalization construction of facilities projects, facility demolition projects, and environmental compliance and restoration activities.

The Construction of Facilities (CoF) Program ensures that the facilities critical to achieving NASA's science, space and aeronautics programs are the right size and type; that they are safe, secure, and environmentally sound; and that they are operated efficiently and effectively. An Agency-wide CoF program ensures that NASA installations conform to requirements and initiatives for the protection of the environment and human health. NASA facilities are essential to the Agency and facility revitalization is needed to maintain infrastructure that is safe and capable of supporting NASA's missions. The facilities being revitalized or constructed in this program are expected to remain active in the long term.

The purpose of NASA's Environmental Compliance and Restoration (ECR) program is to clean up pollutants released to the environment from past activities. Clean up activities are prioritized to ensure that the highest priority liabilities are addressed first, better protecting human health and the environment, and preserving natural resources.

NASA is seeking to amend its Enhanced Use Lease (EUL) authority to allow in-kind consideration for leases to develop renewable energy production facilities. This will create conditions attractive to industry and is necessary to support NASA's strategy to comply with statutory and Executive Order energy and greenhouse gas requirements.

FY 2012 Budget Request

Budget Authority (\$ millions)	FY 2010	Ann CR. FY 2011	Auth Act FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
FY 2012 President's Budget Request	452.8	448.3	394.3	450.4	450.4	450.4	450.4	450.4
Construction of Facilities	389.4	-	-	397.9	384.0	359.5	362.9	360.0
Environmental Compliance and Restoration	63.4	-	-	52.5	66.4	90.9	87.5	90.4

Note:

The FY 2011 appropriation for NASA was not enacted at the time that the FY 2012 Request was prepared; therefore, NASA is operating under a Continuing Resolution (P.L. 111-242, as amended). Amounts in the "Ann. CR FY 2011" column reflect the annualized level provided by the Continuing Resolution.

The "Auth. Act FY 2011" column represents FY 2011 authorized funding from the NASA Authorization Act of 2010 (P.L. 111-267).

In accordance with the President's proposal to implement a five-year non-security discretionary spending freeze, budget figures shown for years after FY 2012 are notional and do not represent policy. Funding decisions will be made on a year-by-year basis.

Plans for FY 2012

Construction and Environmental Compliance and Restoration

Construction of Facilities

Major Highlights for FY 2012

FY 2012 funding will continue essential infrastructure repair and revitalization activities. "Repair by replacement" projects are those that provide sustainable and energy efficient infrastructure by replacing old, inefficient, deteriorated buildings with new, efficient, high-performance buildings. NASA will reduce infrastructure by disposing of unneeded facilities. NASA will continue its strategy to recapitalize essential infrastructure through projects that include the replacement of the potable water system at Stennis Space Center, constructing a consolidated services building at Langley Research Center, replacing the industrial water system in the Marshall Space Flight Center test area, and installing a new antenna at Canberra, Australia.

Environmental Compliance and Restoration

Major Highlights for FY 2012

FY 2012 funding supports cleanup of the Santa Susana Field Laboratory in preparation for dispositioning excess property.

Mission Directorate:	Construction and Environmental Compliance and Restoration
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Theme Overview

CoF designs and executes all programmatic and non-programmatic facilities projects, including discrete minor revitalization and construction projects, and demolition of facilities. The Agency's CoF programs are managed by NASA's Capital Facility Investment program, which includes institutional and programmatic facility investments.

The construction planning process starts several years in advance, with design being funded two budget years prior to construction start. CoF requirements are developed through a process involving both internal and external stakeholders. Institutional CoF requirements from all the Centers are reviewed and prioritized annually, ensuring that only the highest-ranking priorities are funded. Programmatic facility requirements are identified as an integral part of each Mission Directorate's program development process, which ensures that only programmatic CoF projects that are necessary for mission success are funded.

No CoF requirements in support of Aeronautics or Exploration programs are requested for FY 2012.

FY 2012 Budget Request

Budget Authority (\$ millions)	FY 2010	Ann CR. FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
FY 2012 President's Budget Request	<u>389.4</u>	-	<u>397.9</u>	<u>384.0</u>	<u>359.5</u>	<u>362.9</u>	<u>360.0</u>
Institutional CoF	249.3	-	368.0	384.0	359.5	362.9	360.0
Science CoF	37.8	-	1.0	0.0	0.0	0.0	0.0
Space Operations CoF	26.9	-	28.9	0.0	0.0	0.0	0.0
Exploration CoF	72.6	-	0.0	0.0	0.0	0.0	0.0
Aeronautics CoF	2.8	-	0.0	0.0	0.0	0.0	0.0

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Plans for FY 2012

Institutional CoF

The Institutional CoF Program will make capital repairs to NASA's critical infrastructure to improve safety and security, protect NASA's infrastructure, and improve NASA's operating efficiency by reducing utility usage. The program will continue to "right size" the infrastructure by demolishing infrastructure that is no longer needed. Projects with initial cost estimates between \$1 million and \$10 million are included in the program as minor revitalization and construction projects, and projects with initial cost estimates of \$10 million or greater are budgeted as discrete projects. Projects with initial cost estimates of \$1 million or less are accomplished by routine day-to-day facility maintenance and repair activities provided for in program and Center operating budgets.

NASA will invest in projects that protect the Agency's critical assets, improve mission assurance, reduce mission risk, and maintain mission essential capabilities. Investment in projects, such as launch facility protection at Wallops Island, will protect NASA's critical assets in the case of natural disasters. Utility system repairs and replacements will improve reliability throughout NASA's infrastructure and reduce the risk of utility-caused mission failures. Installation of two photovoltaic plants will generate green energy for the Agency, supporting NASA's efforts to meet national initiatives to reduce fossil fuel consumption and green house gas emissions. NASA's repair by replacement program will provide sustainable and energy efficient infrastructure by replacing old, inefficient, deteriorated buildings with new efficient high performance buildings. In some cases, NASA will be able to refurbish existing facilities into sustainable buildings that will meet NASA's future technology needs while retaining only the structure and replacing the systems necessary for mission operations. When this approach is viable, the projects will save capital investment over wholesale replacement, but will still yield a good return on investment through reduced operating costs.

More than 80 percent of NASA's infrastructure is beyond its design life. As NASA's facilities age beyond their useful life, the facilities become unreliable and put NASA's programs and operations at risk. By investing in demolition, NASA will be able to reduce unneeded infrastructure and avoid future expenses for maintaining this infrastructure. The FY 2012 program will continue to demolish facilities that the Agency has identified as unnecessary after the Space Shuttle is retired. This will allow the Agency to shift some investment in Shuttle facilities to support new programs, such as the 21st Century Space Launch Complex. NASA will also demolish obsolete laboratory facilities that no longer support NASA missions. To mitigate the increasing risk to NASA's missions from infrastructure failure, NASA must maintain its investment in infrastructure repair and refurbishment. NASA's long-term strategy is to recapitalize its infrastructure to replace, refurbish, and consolidate critical facilities to support future NASA missions.

Science CoF

The Science CoF Program continues the modification of the thermal vacuum Chamber A at the Johnson Space Center (JSC). This facility provides required temperature and contamination control test conditions for hardware prior to flight. Renovation of the NASA Space Science Data Center at Goddard Space Flight Center will create a sustainable office facility in accordance with Federal energy mandates, and in compliance with applicable codes and standards.

Space Operations CoF

Space Operations CoF continues construction of the 34-Meter Beam Waveguide Antenna, DSS-35, at Canberra, Australia. It also provides for the revitalization of facilities utilized by the Launch Services Program and at Deep Space Network sites.

Relevance

Relevance to national priorities, relevant fields, and customer needs:

CoF funding ensures that NASA's facilities and field installations meet the Agency's infrastructure needs in a safe, secure, and environmentally sound manner. Activities implement sustainable design practices and support compliance with state and national environmental laws and initiatives outlined under the Energy Policy Act of 2005.

Relevance to the NASA Mission and Strategic Goals:

CoF funding is vital to achieve the mission support Strategic Goal "enable program and institutional capabilities to conduct NASA's aeronautics and space activities." The CoF Program supports NASA's Space Flight, Science, and Aeronautics Research missions by ensuring that NASA's greatest mission risks related to infrastructure condition are mitigated; facilities that are critical to NASA missions are maintained, repaired, and refurbished; and facilities that cannot support current and emerging critical technologies are replaced with efficient suitable facilities that will support NASA's strategic goals for research and exploration. The CoF Program strives to reduce facilities operating costs, maintenance burdens, and utility costs to make more of NASA funding available for missions.

Performance

Performance Commitments:

Measure #	Description	Contributing Program (s)
Strategic Goal 5	Enable program and institutional capabilities to conduct NASA's aeronautics and space activities.	
Outcome 5.2	Ensure vital assets are ready, available, and appropriately sized to conduct NASA's missions.	
Objective 5.2.3	Develop and implement long-range infrastructure plans that address institutional capabilities and critical assets, directly link to mission needs, ensure the leveraging of external capabilities, and provide a framework for Agency infrastructure decision-making.	
<i>Performance Goal 5.2.3.1</i>	<i>Consolidate functions and offices to reduce real property need, and use Agency Integrated Master Plan to identify and dispose of excess and aged facilities beyond useful life.</i>	
APG 5.2.3.1: COF-12-1	Initiate facilities demolition process for five significant Agency facilities in addition to demolition processes initiated in FY 2011.	Institutional CoF

Performance Achievement Highlights:

NASA continued essential infrastructure repair and revitalization activities, completing \$387.9 million of construction. Eight facilities received Leadership in Energy and Environmental Design (LEED) certification in FY 2010 including the new office building at JSC, which was certified LEED Platinum. Six other facilities were certified LEED Gold and one was LEED Silver. Additionally, NASA continued reducing its infrastructure by initiating the demolition of 34 unneeded facilities or structures. Assertive recycling strategies and sustainable demolition practices resulted in low cost demolition projects, allowing the Agency to maximize the scope of its demolition program.

Project Descriptions and Explanations of Changes

Summary of FY 2012 Construction of Facilities (CoF) Projects

In Millions of Dollars	FY 2010 Actual	FY 2011 Ann.	FY 2012 CRRequest
<u>Science</u>	<u>37.8</u>	<u>40.5</u>	<u>1.0</u>
Restore Building 26 (GSFC)	---	14.0	---
Modify Thermal Vacuum Chamber A (JSC)	21.6	26.5	1.0
Minor Revitalization of Facilities funded by Earth Science Research (Various Locations)	11.4	---	---
Minor Revitalization of Facilities funded by Heliophysics Research (Various Locations)	1.2	---	---
Facility Planning and Design (Various Locations)	3.6	---	---
<u>Exploration</u>	<u>72.6</u>	<u>45.0</u>	<u>0.0</u>
Modify Space Power Facility, Plum Brook Station (GRC)	23.9	1.2	---
Modify Multi-Payload Processing Facility (KSC)	1.0	---	---
Construct A-3 Propulsion Test Facility (SSC)	31.8	43.4	---
Minor Revitalization of Facilities funded by Constellation Systems (Various Locations)	12.4	---	---
Minor Revitalization of Facilities funded by Exploration Technology (Various Locations)	2.0	---	---
Facilities Planning and Design (Various Locations)	1.5	0.4	---
<u>Space Operations</u>	<u>26.9</u>	<u>20.0</u>	<u>28.9</u>
Construct 34-Meter Beam Waveguide Antennas, Canberra, Australia (JPL)	6.8	7.3	14.5
Revitalize High Pressure Industrial Water System (SSC)	---	6.0	10.0
Minor Revitalization funded by Space Flight Support (Various Locations)	16.6	6.7	4.4
Facility Planning and Design funded by Space Flight Support (Various Locations)	3.5	---	0.0
<u>Aeronautics</u>	<u>2.8</u>	<u>---</u>	<u>---</u>
Minor Revitalization funded by Integrated Systems Research Program (Various Locations)	2.8	---	---
<u>Institutional CoF Projects</u>	<u>249.3</u>	<u>280.7</u>	<u>368.0</u>
Re-skin Hangar 1 (ARC)	---	---	32.8
Construct Flight Project Center (GSFC)	---	---	36.9
Launch Facilities Protection, WFF (GSFC)	7.0	13.0	17.0
Construct West Arroyo Parking Structure (JPL)	---	---	22.0
Revitalize Water and Waste Water Systems, Various Locations (KSC)	---	---	30.0
Construct Integrated Services Building (LaRC)	---	30.4	20.0
Renovate East Test Area Industrial Water Distribution System (MSFC)	---	---	15.0
Replace Potable Water System (SSC)	---	---	10.0
Construct Replacement Facilities Support Center (DFRC)	---	12.5	---
Construct Replacement Engineering Office Building 4220 (MSFC)	---	40.0	---
Repair and Construct Consolidated Information Technology Center, (DFRC)	10.0	---	---
Repair Primary Electrical Distribution-Phase 6 (DFRC)	10.0	---	---
Construct Centralized Office Building (GRC)	25.3	---	---
Construct Shipping and Receiving Facility (GSFC)	12.8	---	---
Revitalize Building 25 Mission Support Building (JSC)	21.3	---	---
Renovation of Operations & Checkout Building (KSC)	15.5	---	---
Revitalize High and Medium Voltage Electrical Distribution Systems (KSC)	19.5	---	---

Mission Directorate: Construction and Environmental Compliance and Restoration**Theme:** Construction of Facilities

Replace Asbestos Siding and Provide Energy/Safety Upgrades, Bldg 4707 (MSFC)	5.0	---	---
Minor Revitalization of Facilities at Various Locations	84.9	137.2	119.3
Demolition of Facilities	15.0	19.9	25.0
Facility Planning and Design	23.0	27.7	40.0

Note: The amounts in the FY 2011 column identify the CoF projects NASA is able to fund within the annualized CR amount for the CECR account.

Discrete Projects**Science CoF**

Project Title: Modify Thermal Vacuum Chamber A

Location: Johnson Space Center, Houston, Texas

Mission Directorate: Science

FY 2012 Estimate: \$1.0 million

This project continues modifications to Chamber A to prepare for testing the James Webb Space Telescope (JWST) Optical Telescope Element and Integrated Science Instrument Module. Modifications include an upgrade of liquid nitrogen systems and an upgrade of high vacuum systems, which includes: installation of new gate valves and new cryogenic pumps; the installation of a helium system (both refrigeration system and shroud); and installation of a new clean air system in the chamber. These modifications to thermal vacuum Chamber A are necessary to achieve the required temperature and contamination control test conditions for flight hardware. This is the fifth increment for this project for a total project cost estimate of \$73.9 million. Program replanning efforts, discussed in the Science section, may impact the schedule of this project.

Space Operations CoF

Project Title: Construct 34-Meter Beam Waveguide Antennas

Location: Canberra, Australia

Mission Directorate: Space Operations

FY 2012 Estimate: \$14.5 million

This project includes fabrication and installation of the antenna structure, panels, gearboxes, bearings, electric drives, encoders, beam waveguide mirrors, subreflector and subreflector positioner for Deep Space Network antennas. This third increment completes Deep Space Station-35 (DSS-35) and initiates construction of Deep Space Station-36 (DSS-36), which will be funded in three increments. It also includes the design and construction of the antenna structure, foundations and pedestals, as well as facilities in and around the Canberra Deep Space Communication Complex, such as paved access roads, trenches, drainage, flood control devices, water main and distribution system, antenna apron, security fence, heating, ventilation, and air conditioning (HVAC), electrical power distribution, fire detection and suppression system, and surveillance system assembly. Multiple Beam Waveguide antennas are needed to add resilience in the southern hemisphere for the Deep Space Network. These antennas are needed to support additional mission loading from projects currently under development and scheduled for launch during or after 2015. The first antenna estimated construction cost is \$24.0 million and the second antenna estimated construction cost is \$25.2 million. Construction of the third antenna is anticipated to begin in FY 2014 with an estimated construction cost of \$26.5 million. The total estimated construction cost for all three antennas is \$75.7 million.

Project Title: Revitalize High Pressure Industrial Water System

Location: Stennis Space Center, Stennis Space Center, Mississippi

Mission Directorate: Space Operations

FY 2012 Estimate: \$10.0 million

This project consists of construction of a new High Pressure Industrial Water (HPIW) Distribution Piping System. The HPIW directly supports testing rocket engines in the A and B Test Complexes at Stennis Space Center (SSC) by supplying water for test stand deflector coolant, fire protection (deluge system), and diffuser operation. It also furnishes water for fire protection of the Liquid Hydrogen and Liquid Oxygen barges located at the test stand docks. Replacement of the HPIW is necessary due to age-related poor condition (i.e., excessive leakage caused by corrosion). Continuous use of the facilities supported by this project is consistent with the SSC Master Plan and Agency goals to reduce deferred maintenance and upgrade basic institutional infrastructure. Total project cost is \$40 million.

Institutional CoF

Project Title: Re-skin Hangar 1

Location: Ames Research Center, Moffett Field, CA

FY 2012 Estimate: \$32.8 million

This project will install a new envelope on NASA Ames Research Center's Hangar One with new materials which will complement the historic structure's architecture. The Navy is currently remediating hazardous waste and environmental contamination. The Navy is removing the facility envelope as part of their remediation work. This project will install new exterior siding, roof and windows. The completed project will provide a weather tight structure. The scope of this project does not include upgrading building mechanical or electrical systems. This project will be executed as a design build project so NASA can explore competing concepts to best reflect the historic nature of this structure.

Project Title: Construct Flight Project Center

Location: Goddard Space Flight Center, Greenbelt, Maryland

FY 2012 Estimate: \$36.9 million

This project designs and constructs a 95,000 GSF (gross square feet) office building for the Flight Projects Directorate (FPD). The new multi-story building will have maximal reconfigurable office space to house approximately 300 people. The building envelope will blend with its surroundings. The proposed site is south of the existing Building 16 Complex and east of existing Building 12. Following construction, the Building 16 complex will be demolished in accordance with Master Plan current replacement value reductions. The Building 16 Complex is comprised of Building 016 (two-story brick office building), Building 016W (warehouse/office structure), Building 016A (Gas Cylinder Storage), Building 016B (Ordnance), and Building 086 (Project Support Facility.) The total demolition will be 222,464 GSF.

Project Title: Launch Facilities Protection

Location: Wallops Flight Facility, Wallops Island, Virginia

FY 2012 Estimate: \$17.0 million

This is the third and final increment for Wallops Island Launch Facilities Protection. The first increment extended the seawall south approximately 1,500 feet to protect existing assets and repair the failing seawall, as recommended after a detailed inspection. This increment will begin the sand fill portion of the project. The completed beach fill segment will provide a 70-foot wide dry beach in front of the seawall (about 3 million cubic yards) along its entire length (6,800 meters). Wallops Island has experienced erosion throughout the six decades of NASA occupation. Since the 1990s, part of the island has been protected with a stone rubble-mound seawall. Although the seawall has temporarily limited the shoreline's erosion, the structure is being undermined and is failing. This is occurring because there is little or no protective sand beach remaining and waves break directly on the sea wall. The south end of the island is currently unprotected and suffers continuous erosion. A 2006 Army Corps of Engineers study titled "Beach Erosion Mitigation and Sediment Management Alternatives at Wallops Island, VA" validates the need and outlines the requirements for protection. The Wallops Launch Range supports sounding rocket and NASA small satellites launches, Commercial Orbital Transportation Services (COTS) demonstration and re-supply to the International Space Station, launches for other Federal and commercial entities, and unmanned aerial vehicle (UAV) flights. The total project cost is \$37.6 million. The project will provide a complete solution when this final increment is executed.

Project Title: Construct West Arroyo Parking Services

Location: Jet Propulsion Laboratory, Pasadena, California

FY 2012 Estimate: \$22.0 million

This project constructs a multi-level parking garage to accommodate a minimum of 700 to 1,000 vehicles at the eastern boundary of the Jet Propulsion Laboratory (JPL) Oak Grove site, an area of approximately 1.6 acres currently used for surface parking. It will utilize a design and build project delivery methodology and building information modeling (BIM) in order to meet sustainable design objectives and net-zero energy usage. Underground utilities located within the footprint of the proposed garage will be relocated, including: an eight-inch sanitary sewer line; a 10-inch water main; storm drains; catch basins; and medium pressure gas lines. New work includes the garage superstructure, driving surfaces, water- and dampproofing, perimeter spandrel panels and cable barriers, stairs, elevators, lighting, and code-required fire alarm and protection systems. Roadway, hardscape, landscape, security, and parking control items related to changes in vehicle and pedestrian traffic flows will be addressed and mitigated.

In the summer of 2013, the city of Pasadena will construct ground water percolation ponds on the 11-acre East Arroyo site currently leased by JPL from the city and used for parking 1,100 employee vehicles. The city of Pasadena requires JPL to vacate the property in December 2012 to allow for restoration of the site in accordance with lease requirements. The loss of 1,100 parking spaces represents 24 percent of the 4,575 total parking spaces currently available for JPL employees. Of the total 4,575 available parking spaces, it is not uncommon for there to be fewer than 20 vacant parking spaces reported during weekly counts by JPL Protective Services. There is no "spare capacity," and JPL cannot absorb the loss of almost 25 percent of its parking spaces. In addition to the 1,100 space Pasadena lot, NASA JPL also leases a second 1,100 space parking lot from the Flintridge Riding Club, located on the western boundary of the site. At present, leased parking represents nearly one-half of the total parking supply. Construction of a 700 to 1,000 vehicle garage will help to provide sufficient parking and reduce dependence on leaseholders.

Project Title: Revitalize Water and Waste Water Systems, Various Locations

Location: Kennedy Space Center, Kennedy Space Center, Florida

FY 2012 Estimate: \$30.0 million

This project will replace water lines throughout the Kennedy Space Center (KSC) water distribution system. Pipeline replacement is to include critical water mains, facility service lines, valves, and fire hydrants. Water meters will be installed at larger facilities to monitor water flow and progress of initiatives set to reduce water consumption. This project will rehabilitate lift stations through replacement of pumps, risers, controllers, valves, structure, and other aging lift station components. This project will also upgrade waste water system monitoring with an enhanced Supervisory Control and Data Acquisition (SCADA) system for lift station monitoring and energy optimization. Most of the components of the Center's water and waste water system are 45 years old and have exceeded their design life expectancy. This project continues an effort to improve KSC's water quality, replace aging system pipes and lift stations, reduce excessive water flushing, and eliminate drinking water notifications to the entire KSC workforce, which has resulted in drinking water lock outs arising from poor water quality. This is Phase four of five, with a total project cost of \$53.0 million.

Project Title: Construct Integrated Services Building

Location: Langley Research Center, Hampton, Virginia

FY 2012 Estimate: \$20.0 million

This project constructs a two-story integrated services building and provides related site improvements. The new 95,000 square foot building will house up to 125 administrative personnel and incorporate the media services center, main conference facilities, cafeteria, training classrooms, and many other services now scattered throughout Langley. The Integrated Services Building will be located very close to the center of the campus and will be energy efficient, designed to meet or exceed silver requirements of the U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) certification. Site improvements include upgrades to the existing pedestrian walkway, addition of a civic mall in the center of the campus, and expansion of surrounding parking lots. The project also includes demolition of six older buildings directly impacted by this project, removing 98,000 square feet of floor space and eliminating \$37.8 million in deferred maintenance.

The buildings to be replaced by the new Integrated Services Building are over 60 years old. The fire protection systems in these older facilities are very inadequate. Most do not have sprinkler systems and many of the fire alarms, smoke detection systems, and fire exits are not code compliant. The majority of these older facilities have antiquated HVAC systems, which frequently break down and disrupt operations. The existing media services are located in four separate locations, causing this service to be very inefficient. These buildings have potential problems with hazardous materials such as asbestos, polychlorinated biphenyls (PCBs) ballasts, mercury thermostats, and lead, chromium, and cadmium-based paints. Half of the buildings are not compliant with Americans with Disabilities Act regulations. All of these facilities are run down, inefficient, and inadequate to perform their intended functions. Renovation of the existing facilities is not cost effective and eliminating these facilities reduces the risk of accidental injury or death from fire or other system failures. This is the second of two increments with a total estimated construction cost of \$50.4 million. The project will provide a complete and usable facility when this final increment is completed.

Project Title: Renovate East Test Area Industrial Water Distribution System

Location: Marshall Space Flight Center, Huntsville, Alabama

FY 2012 Estimate: \$15.0 million

This project will replace 45 year old deteriorated industrial piping located in the East Test Area of the Marshall Space Flight Center (MSFC). In addition to the new piping, outdated diesel pumps will be replaced with new energy efficient electric pumps and centrally located controls. The installation of the new piping and pumps is necessary to boost pressures and flows to adequate levels in support of all facilities located in the test area. Continuous use of the facilities supported by this project is consistent with the MSFC Master Plan and Agency goals to reduce deferred maintenance and upgrade basic institutional infrastructure.

Project Title: Replace Potable Water System

Location: Stennis Space Center, Mississippi

FY 2012 Estimate: \$10.0 million

This project will substantially replace the Stennis Space Center (SSC) system-wide potable water system. The project will replace existing main distribution piping constructed with more than 40-year old asbestos cement (transite), ductile cast iron, and steel materials. The project also replaces associated valves and hydrants directly connected to the main distribution system. Repair of the SSC potable water system is necessary due to its age-related poor condition (i.e., excessive leakage, corrosion, and potential human health hazard). Continuous use of the facilities supported by this project is consistent with the SSC Master Plan and Agency goals to reduce deferred maintenance and upgrade basic institutional infrastructure.

Minor Revitalization & Construction of Facilities (projects less than \$10.0 million each)

This request includes facility revitalization and construction needs with initial cost estimate greater than \$1.0 million but less than \$10.0 million per project. Projects with initial cost estimates of \$1.0 million or less are normally accomplished by routine day-to-day facility maintenance and repair activities provided for in direct program and Center operating budgets. Proposed FY 2012 institutional minor revitalization and construction projects total \$119.3 million for components of the basic infrastructure and institutional facilities, and programmatic projects total \$4.4 million. These resources provide for revitalization and construction of facilities at NASA facility installations and government-owned industrial plants supporting NASA activities. Revitalization and modernization projects provide for the repair, modernization, and/or upgrade of facilities and collateral equipment. Repair projects restore facilities and components to a condition substantially equivalent to the originally intended and designed capability. Repair and modernization work includes the substantially equivalent replacement of utility systems and collateral equipment necessitated by incipient or actual breakdown. It also includes major preventive measures that are normally accomplished on a cyclic schedule and those quickly needed out-of-cycle, based on adverse condition information revealed during predictive testing and inspection efforts. Modernization and upgrade projects include both restoration of current functional capability and enhancement of the condition of a facility so that it can more effectively accomplish its designated purpose, increase its functional capability, or so that it can meet new building, fire, and accessibility codes.

The minor revitalization and construction projects that comprise this request are of the highest priority, based on relative urgency, and expected return on investment. During the year, some rearrangement of priorities may be necessary, which may cause a change in some of the items to be accomplished.

Minor Revitalization Center Distribution

Space Operations

- A. Jet Propulsion Laboratory, \$2.8 million
 - 1. Modify Signal Processing Center Electrical Distribution, Madrid, Spain
 - 2. Replace Beam Waveguide Azimuth Tracks, 34M Subnet, Goldstone, CA
- B. Kennedy Space Center, \$1.6 million
 - 1. Repair and Renovate Building 836, Vandenberg, AFB, CA

Institutional

- A. Dryden Flight Research Center, \$20.8 million
 - 1. Repair by Replacement Fire Main Distribution System, Center-wide
 - 2. Repair Electrical Distribution, Phase 7 of 8
 - 3. Repair Flightline Access Roads & Aircraft Ramps, Phase 2 of 2
 - 4. Construct Photovoltaic Solar Power System
- B. Glenn Research Center, \$16.5 million
 - 1. Upgrade Campus Security Requirements
 - 2. Repair Cooling Tower Water Systems, Phase 2 of 3
 - 3. Repair Natural Gas System, Plum Brook Station
- C. Goddard Space Flight Center, \$2.3 million
 - 1. Upgrade Chiller/Boiler Plant Controls, Building 24
- D. Jet Propulsion Laboratory, \$4.7 million
 - 1. Replace LN2 Tanks, Phase 4 of 7
 - 2. Upgrade South Gate Security
- E. Johnson Space Center, \$21.9 million
 - 1. Upgrade and Replace Fire Alarm Network Nodes, Phase 1 of 2
 - 2. Upgrade and Repair Electrical Systems, Site-wide
 - 3. Upgrade Main Electrical Switchyard and Replace Site Poles, WSTF
 - 4. Upgrade Communications and Personnel Warning System, WSTF
 - 5. Construct 500kW Stationary Photovoltaic Solar Array System, WSTF
- F. Kennedy Space Center, \$3.0 million
 - 1. Replace Chilled Water Controls, Industrial Area
- G. Langley Research Center, \$18.0 million
 - 1. Rehabilitate Steam System and Plant
 - 2. Rehabilitate Electrical Systems
 - 3. Replace/Upgrade Fire Detection/Suppression Systems, Various Facilities (1148, 1232, 1235, 1250)

H. Marshall Space Flight Center, \$21.0 million

1. Repair and Modify Critical Mechanical and Electrical Systems for Reliability, Building 4663
2. Upgrade Safety and Energy Systems, Buildings 4708,4619,4755
3. Upgrade/Repair Electrical Distribution System, North Campus

I. Stennis Space Center, \$11.1 million

1. Repair B Test Stand and Dock
2. Repair Electrical Unit Substations
3. Repair Canal System Spillway
4. Upgrade Safety and Energy Systems, Building 1100

Demolition of Facilities

Cognizant Office: Office of Strategic Infrastructure

FY 2012 Estimate: \$25.0 million

The funds requested will be used to eliminate inactive and obsolete facilities that are no longer required for NASA's Mission. Abandoned facilities present eyesores on the Centers and pose a potential safety and environmental liability. These abandoned facilities must still be maintained at minimal levels to prevent increasing safety and environmental hazards. These recurring maintenance costs impose a drain on the limited maintenance dollars needed at the Centers. Demolishing these abandoned facilities will allow the Agency to avoid non-productive operating costs required to keep abandoned facilities safe and secure. Furthermore, demolition is the most cost effective way to reduce the Agency deferred maintenance.

NASA identifies potential facilities for the demolition program through special studies to determine if the facility is required for a current or future missions. Facilities that are no longer needed are included in a five-year demolition plan that sets project schedules based on last need, annual costs avoided, potential liability, and project execution factors. Individual project schedules are sometimes adjusted in response to factors such as consultation with states on historic properties, changes in operational schedules, environmental remediation, funding profiles, local market forces, and cost of recycled materials. Proposed FY 2012 demolition projects will reduce annual facilities costs by an estimated \$3.2 million.

Facility Planning and Design

Cognizant Office: Office of Strategic Infrastructure

FY 2012 Estimate: \$40.0 million

These funds are required for: advance planning and design activities; special engineering studies; facility engineering research; preliminary engineering efforts required to initiate design-build projects; preparation of final designs, construction plans, specifications, and associated cost estimates; and participation in facilities-related professional engineering associations and organizations. These resources provide for project planning and design activities associated with non-programmatic construction projects. Project planning and design activities for construction projects required to conduct specific programs or projects are included in the appropriate budget line item. Other activities funded include: master planning; value engineering studies; design and construction management studies; facility operation and maintenance studies; facilities utilization analyses; engineering support for facilities management systems; and capital leveraging research activities. The increase in facilities planning and design is crucial in implementation of the NASA Recapitalization Program. These recapitalization projects are necessary to make progress toward required sustainability, energy, and stewardship goals.

Mission Directorate:	Construction and Environmental Compliance and Restoration
Theme:	Construction of Facilities
Program:	Institutional CoF

FY 2012 Budget Request

Budget Authority (\$ millions)	FY 2010	Ann CR. FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
FY 2012 President's Budget Request	<u>249.3</u>	=	<u>368.0</u>	<u>384.0</u>	<u>359.5</u>	<u>362.9</u>	<u>360.0</u>
Institutional CoF	249.3	-	368.0	384.0	359.5	362.9	360.0

Note:

The FY 2011 appropriation for NASA was not enacted at the time that the FY 2012 Request was prepared; therefore, NASA is operating under a Continuing Resolution (P.L. 111-242, as amended). Amounts in the "Ann. CR FY 2011" column reflect the annualized level provided by the Continuing Resolution.

In accordance with the President's proposal to implement a five-year non-security discretionary spending freeze, budget figures shown for years after FY 2012 are notional and do not represent policy. Funding decisions will be made on a year-by-year basis.

Mission Directorate:	Construction and Environmental Compliance and Restoration
Theme:	Construction of Facilities
Program:	Science CoF

FY 2012 Budget Request

Budget Authority (\$ millions)	FY 2010	Ann CR. FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
FY 2012 President's Budget Request	<u>37.8</u>	=	<u>1.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Science CoF	37.8	-	1.0	0.0	0.0	0.0	0.0

Note:

The FY 2011 appropriation for NASA was not enacted at the time that the FY 2012 Request was prepared; therefore, NASA is operating under a Continuing Resolution (P.L. 111-242, as amended). Amounts in the "Ann. CR FY 2011" column reflect the annualized level provided by the Continuing Resolution.

In accordance with the President's proposal to implement a five-year non-security discretionary spending freeze, budget figures shown for years after FY 2012 are notional and do not represent policy. Funding decisions will be made on a year-by-year basis.

Mission Directorate:	Construction and Environmental Compliance and Restoration
Theme:	Construction of Facilities
Program:	Exploration CoF

FY 2012 Budget Request

Budget Authority (\$ millions)	FY 2010	Ann CR. FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
FY 2012 President's Budget Request	<u>72.6</u>	=	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Exploration CoF	72.6	-	0.0	0.0	0.0	0.0	0.0

Note:

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In accordance with the President's proposal to implement a five-year non-security discretionary spending freeze, budget figures shown for years after FY 2012 are notional and do not represent policy. Funding decisions will be made on a year-by-year basis.

Mission Directorate:	Construction and Environmental Compliance and Restoration
Theme:	Construction of Facilities
Program:	Space Operations CoF

FY 2012 Budget Request

Budget Authority (\$ millions)	FY 2010	Ann CR. FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
FY 2012 President's Budget Request	<u>26.9</u>	=	<u>28.9</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Space Operations CoF	26.9	-	28.9	0.0	0.0	0.0	0.0

Note:

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In accordance with the President's proposal to implement a five-year non-security discretionary spending freeze, budget figures shown for years after FY 2012 are notional and do not represent policy. Funding decisions will be made on a year-by-year basis.

Mission Directorate:	Construction and Environmental Compliance and Restoration
Theme:	Construction of Facilities
Program:	Aeronautics CoF

FY 2012 Budget Request

Budget Authority (\$ millions)	FY 2010	Ann CR. FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
FY 2012 President's Budget Request	<u>2.8</u>	=	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Aeronautics CoF	2.8	-	0.0	0.0	0.0	0.0	0.0

Note:

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In accordance with the President's proposal to implement a five-year non-security discretionary spending freeze, budget figures shown for years after FY 2012 are notional and do not represent policy. Funding decisions will be made on a year-by-year basis.

Mission Directorate:	Construction and Environmental Compliance and Restoration
Theme:	Environmental Compliance and Restoration
Program:	Environmental Compliance and Restoration

FY 2012 Budget Request

Budget Authority (\$ millions)	FY 2010	Ann CR. FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
FY 2012 President's Budget Request	63.4	-	52.5	66.4	90.9	87.5	90.4
Environmental Compliance and Restoration	63.4	-	52.5	66.4	90.9	87.5	90.4

Note:

The FY 2011 appropriation for NASA was not enacted at the time that the FY 2012 Request was prepared; therefore, NASA is operating under a Continuing Resolution (P.L. 111-242, as amended). Amounts in the "Ann. CR FY 2011" column reflect the annualized level provided by the Continuing Resolution.

In accordance with the President's proposal to implement a five-year non-security discretionary spending freeze, budget figures shown for years after FY 2012 are notional and do not represent policy. Funding decisions will be made on a year-by-year basis.

Program Overview

NASA's ECR program completes the cleanup of hazardous materials and wastes that have been released to the surface or groundwater at NASA installations, NASA-owned industrial plants supporting NASA activities, current or former sites where NASA operations have contributed to environmental problems, and other sites where the Agency is legally obligated to address hazardous pollutants. Nearly \$1 billion worth of cleanup liabilities impact the NASA Centers. The cleanups are prioritized to ensure that the highest priority liabilities are addressed first, better protecting human health and the environment, and preserving natural resources. ECR program activities include projects, studies, assessments, investigations, plans, designs, related engineering, program support, sampling, monitoring, and regulatory agency oversight costs. Funding also covers and any land acquisitions necessary to ensure operation of remedial treatment processes and sites as part of the remediation and cleanup measures.

In response to recent Executive Orders to consider the increasing impacts of global climate change on NASA facilities and projects, the ECR program provides for strategic investment in environmental methods and practices that ensure NASA may continue to carry out its scientific and engineering missions. Included are investments in methodologies for sustainably reducing energy intensity and greenhouse gas emissions, and supporting operational activities by ensuring that advances in chemical risk management are incorporated early in mission design phases.

Additional information concerning NASA's ECR program can be found at <http://www.nasa.gov/offices/emd/home/ecr.html>.

Mission Directorate:	Construction and Environmental Compliance and Restoration
Theme:	Environmental Compliance and Restoration
Program:	Environmental Compliance and Restoration

Plans For FY 2012

The FY 2012 funding request represents a prioritized, risk-based approach for addressing a total of 136 cleanup projects remaining at all NASA Centers and is based upon the relative urgency and the potential health and safety hazards related to each individual cleanup. As studies, assessments, investigations, plans, regulatory approvals, and designs progress and as new discoveries or regulatory requirements change, it is expected that program priorities may change, requiring revisions to planned activities. Major activities and cleanups with the highest priority requirements planned for FY 2012 include:

1. Implementing thorough investigation and cleanup at Santa Susana Field Laboratory in accordance with a new Consent Order with the State of California, ensuring full public involvement throughout the process.
2. Continuing cleanup of ground water contamination and investigation of soil contamination at White Sands Test Facility, New Mexico; and
3. Operating and maintaining systems to address contaminated groundwater and drinking water emanating from the Jet Propulsion Laboratory, California.